

1

2

3

4

5

6

7

8

9

10

11

12

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica St. Louis

13715 Rider Trail North

Earth City, MO 63045

Tel: (314)298-8566

TestAmerica Job ID: 160-5703-1

Client Project/Site: Glen Isle, Radiological Analyses

For:

Posillico Dev Company at Harbor Isle LLC

1750 New Highway

Farmingdale, New York 11735

Attn: Ellis Koch

*Rhonda Ridenhower*

Authorized for release by:

3/14/2014 4:57:02 PM

Rhonda Ridenhower, Manager of Project Management

(314)298-8566

[rhonda.ridenhower@testamericainc.com](mailto:rhonda.ridenhower@testamericainc.com)

### LINKS

Review your project  
results through

TotalAccess

Have a Question?

Ask  
The  
Expert

Visit us at:

[www.testamericainc.com](http://www.testamericainc.com)

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

# Table of Contents

Cover Page .....	1
Table of Contents .....	2
Case Narrative .....	3
Chain of Custody .....	6
Receipt Checklists .....	10
Definitions/Glossary .....	11
Method Summary .....	12
Sample Summary .....	13
Client Sample Results .....	14
QC Sample Results .....	19
QC Association Summary .....	24
Tracer Carrier Summary .....	26

## Case Narrative

Client: Posillico Dev Company at Harbor Isle LLC  
Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

**Job ID: 160-5703-1**

**Laboratory: TestAmerica St. Louis**

Narrative

### CASE NARRATIVE

**Client: Posillico Dev Company at Harbor Isle LLC**

**Project: Glen Isle, Radiological Analyses**

**Report Number: 160-5703-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica St. Louis attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

#### RECEIPT

The samples were received on 02/26/2014; the samples arrived in good condition, properly preserved. The temperature of the coolers at receipt was 21.3 C.

#### RADIUM 226 (0 DAY INGROWTH)

Sample FB028 (160-5703-5) was analyzed for radium 226 (0 day ingrowth) in accordance with EPA 903. The samples were prepared on 02/27/2014 and analyzed on 02/28/2014.

Radium 226 was analyzed without ingrowth, as such, the results may be biased high.

No other difficulties were encountered during the Radium 226 analysis.

All other quality control parameters were within the acceptance limits.

#### RADIUM-228 (GFPC)

## Case Narrative

Client: Posillico Dev Company at Harbor Isle LLC  
Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

### Job ID: 160-5703-1 (Continued)

#### Laboratory: TestAmerica St. Louis (Continued)

Sample FB028 (160-5703-5) was analyzed for Radium-228 (GFPC) in accordance with EPA 904. The samples were prepared on 02/27/2014 and analyzed on 03/03/2014.

No difficulties were encountered during the Radium-228 analysis.

All quality control parameters were within the acceptance limits.

#### ISOTOPIC THORIUM (ALPHA SPECTROMETRY)-Solids

Samples CC-C-048-2-4 (160-5703-1), CC-C-050-0-2 (160-5703-2), LT-G-026-4-6 (160-5703-3) and LT-G-027-8-10 (160-5703-4) were analyzed for Isotopic Thorium (Alpha Spectrometry) in accordance with DOE A01R\_Th. The samples were dried on 02/26/2014, prepared on 03/03/2014 and analyzed on 03/06/2014.

No difficulties were encountered during the Isotopic Thorium analysis.

All quality control parameters were within the acceptance limits.

#### ISOTOPIC THORIUM (ALPHA SPECTROMETRY)-Water

Sample FB028 (160-5703-5) was analyzed for Isotopic Thorium (Alpha Spectrometry) in accordance with DOE. The samples were prepared on 03/03/2014 and analyzed on 03/05/2014.

No difficulties were encountered during the Isotopic Thorium analysis.

All quality control parameters were within the acceptance limits.

#### ISOTOPIC URANIUM (ALPHA SPECTROMETRY)-Solids

Samples CC-C-048-2-4 (160-5703-1), CC-C-050-0-2 (160-5703-2), LT-G-026-4-6 (160-5703-3) and LT-G-027-8-10 (160-5703-4) were analyzed for Isotopic Uranium (Alpha Spectrometry) in accordance with DOE. The samples were dried on 02/26/2014, prepared on 03/07/2014 and analyzed on 03/12/2014.

No other difficulties were encountered during the Isotopic Uranium analysis.

All other quality control parameters were within the acceptance limits.

#### ISOTOPIC URANIUM (ALPHA SPECTROMETRY)-Water

Sample FB028 (160-5703-5) was analyzed for Isotopic Uranium (Alpha Spectrometry) in accordance with DOE. The samples were prepared on 03/03/2014 and analyzed on 03/05/2014.

No difficulties were encountered during the Isotopic Uranium analysis.

All quality control parameters were within the acceptance limits.

#### CESIUM-137 & OTHER GAMMA EMITTERS (GS)-Water

Sample FB028 (160-5703-5) was analyzed for Cesium-137 & Other Gamma Emitters (GS) in accordance with DOE. The samples were prepared on 02/27/2014 and analyzed on 03/07/2014.

The reporting limit was not met despite the activity being below the reporting limit. Protactinium-234 and protactinium-231 have an elevated MDC due to low abundance. The activity is not supported by thorium-234 or other members of the decay chain. The data is reported with the MDC achieved. (160-5691-1 DU), (MB 160-107877/1-A), FB028 (160-5703-5)

No other difficulties were encountered during the gamma spec analysis.

All other quality control parameters were within the acceptance limits.

#### RADIUM 226 (NO INGROWTH)-Solids

Samples CC-C-048-2-4 (160-5703-1), CC-C-050-0-2 (160-5703-2), LT-G-026-4-6 (160-5703-3) and LT-G-027-8-10 (160-5703-4) were

## Case Narrative

Client: Posillico Dev Company at Harbor Isle LLC  
Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

### Job ID: 160-5703-1 (Continued)

#### Laboratory: TestAmerica St. Louis (Continued)

analyzed for Radium 226 (No ingrowth) in accordance with GA-01-R. The samples were dried on 02/26/2014, prepared on 02/28/2014 and analyzed on 03/05/2014, 03/06/2014, 03/07/2014 and 03/10/2014.

The RER was outside of the acceptance limits of 1 for protactinium-231. Both the sample and duplicate activity were less than the MDC. (LCS 160-107955/2-A), (MB 160-107955/1-A), CC-C-048-2-4 (160-5703-1), CC-C-050-0-2 (160-5703-2), LT-G-026-4-6 (160-5703-3), LT-G-027-8-10 (160-5703-4).

The reporting limits for bismuth-212 and/or lead-210 analyzed by gamma spectroscopy were not met due to activity in the samples. The data is reported with the MDC achieved. CC-C-048-2-4 (160-5703-1), CC-C-050-0-2 (160-5703-2), LT-G-026-4-6 (160-5703-3), LT-G-027-8-10 (160-5703-4)

Radium-226 is quantified using the 186 keV line and matrix interference correction for Uranium-235. Doing this has the potential to produce a bias in the result. Evaluation of the Radium-226 result in correlation with the Lead- and Bismuth-214 results, on an individual sample basis is recommended.

No other difficulties were encountered during the Gamma spec analysis.

All other quality control parameters were within the acceptance limits.

# Chain of Custody Record

# TestAme

Temperature on Receipt \_\_\_\_\_

Drinking Water? Yes  No

THE LEADER IN ENVIRONMEN

480-55157 Chain of Custody

TAL-4124 (1007)

Client Address	EllisKoch-RXR-Glantz Partners 6025 RXR Plaza			Project Manager	Derek Eshback	
City	Uniondale	State	NY	Zip Code	11550	
Project Name and Location (State)			A. Rauanichko GLEN TSO Westerfront Development Contract/Purchase Order/Quote No.			
			Site Contact	Lab Contact		
			A. Rauanichko			
			Carrier/Mail Number			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)		Date	Time	Matrix	Containers & Preservatives		Special Instructions/ Conditions of Receipt
					Asbestos	Solvent	
CC-C-048-0-2	2-21-14	900		903	X	X	ESU/Jan/Un (4-0-1) ISST/HOR/Un (4-0-1) Quarantine Spec (4-0-1) Motels (600/1171) RESC/Recycles (8270)
CC-C-048-2-4		905		905	X	X	
CC-C-048-4-6		910		910	X	X	
CC-C-048-8-10		910		910	X	X	
CC-C-049-0-2		1035		1035	X	X	
CC-C-049-2-4		1040		1040	X	X	
CC-C-049-8-10		1045		1045	X	X	
CC-C-050-0-2		1000		1000	X	X	
CC-C-050-2-4		1005		1005	X	X	
CC-C-050-8-10		1010		1010	X	X	
dup027		1010		1010	X	X	
CC-C-051-0-2	V	1145		1145	X	X	
Possible Hazard Identification					Sample Disposal		
<input type="checkbox"/> Non-Hazard	<input type="checkbox"/> Flammable	<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input type="checkbox"/> Unknown	<input type="checkbox"/> Return To Client	<input type="checkbox"/> Disposal By Lab	
<input type="checkbox"/> 24 Hours	<input type="checkbox"/> 48 Hours	<input type="checkbox"/> 7 Days	<input type="checkbox"/> 14 Days	<input type="checkbox"/> 21 Days	<input type="checkbox"/> Other	<input type="checkbox"/> Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)	
Turn Around Time Required					QC Requirements (Specify)		
1. Relinquished By	<i>M. Malib</i>	2/24/14	Time 10:20	Date 2/24/14	Time 10:00	1. Received By <i>J. J. D.</i>	
2. Relinquished By				Date	Time	2. Received By	
3. Relinquished By	<i>B. Sonin - T.A.</i>	02-24-14	13:00	Date 2/25/14	Time 0900	3. Received By	
Comments	<i>HHR</i>	2-25-14 1700					

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

#2 3051, 5, 3, 5, 7  
J. Clark 2-26-14 0920

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## **CHAIN OF CUSTODY / ANALYSIS REQUEST**

777 New Durham Road  
Edison, New Jersey 08817  
Phone: (732) 549-3900 Fax: (732) 549-3679

Name (for report and invoice)	Samplers Name (Printed)		Site/Project Identification		LAB USE ONLY	
Company	Ameri-Geomatics, Inc. F. Hispano		Glen Isle Waterfront Redevelopment		Project No:	
P. O. #			State (Locality): NJ: <input checked="" type="checkbox"/> NY: <input type="checkbox"/>		Other: <input type="checkbox"/>	
Address	1025 River Plaza		Regulatory Program:			
City	Uniondale NY		ANALYSIS REQUESTED (ENTER BEEF TO INDICATE REQUEST)		Sample Numbers	
Phone	Fax		Standard: <input checked="" type="checkbox"/>	Rush Charges Authorized For:		
			<input type="checkbox"/> 2 week	<input type="checkbox"/> 1 week		
			<input type="checkbox"/> Other			
Sample Identification	Date	Time	Matrix	No. of Cont.		
LT-C-053-4-4	2/21/9	1335	soil	2	X	X
LT-C-053-6-8	2/21/9	1340	soil	2	X	X
LT-C-054-0-2	2/21/9	1405	soil	2	X	X
LT-C-054-2-4	2/21/9	1410	soil	2	X	X
LT-C-057-0-2	2/21/9	1515	soil	1	X	X
LT-C-057-2-4	2/21/9	1520	soil	1	X	X
LT-C-057-6-8	2/21/9	1525	soil	1	X	X
FBOO4-6AU	2/21/9	1400	liquid	5	X	X
FBO28	2/21/9	1420	liquid	12	X	X
TB					X	X
Preservation Used: 1 = ICE, 2 = HCl, 3 = H <sub>2</sub> SO <sub>4</sub> , 4 = HNO <sub>3</sub> , 5 = NaOH 6 = Other: _____, 7 = Other: _____						
Soil: _____ Water: _____						

Preservation Used: 1 = ICE, 2 = HCl, 3 =  $H_2SO_4$ , 4 =  $HNO_3$ , 5 = NaOH  
6 = Other \_\_\_\_\_, 7 = Other \_\_\_\_\_

Special Instructions

Relinquished by		Date / Time Received by	Company	Entered by
Mr. H. J. Railey	Company D.M.C.	2/24/16 Date / Time 1)	Received by J.S. 2)	Company J.S.
B. Sonny	Company T.A.	02-24-16 13:00 Date / Time 3)	Received by H. J. Mohr 3)	Company H. J. Mohr 2/25/16 Date / Time 4)
	Company T.A.	2/25/16 17:00 Date / Time 4)	Received by T.A. 2/26/16 Date / Time 4)	Company T.A. 2/26/16 Date / Time 4)

Laboratory Certifications: New Jersey (112028), New  
Massachusetts (M-N-1312), North Carolina (No. 578)

#2 3@5.1, 5,3,5,  
0), Rhode Island (132). TAL-0016 (0408)



## Login Sample Receipt Checklist

Client: Posillico Dev Company at Harbor Isle LLC

Job Number: 160-5703-1

**Login Number: 5703**

**List Source: TestAmerica St. Louis**

**List Number: 1**

**Creator: Clarke, Jill C**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	Thermal preservation not required.
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## Definitions/Glossary

Client: Posillico Dev Company at Harbor Isle LLC  
Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

### Qualifiers

#### Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.
G	The Sample MDC is greater than the requested RL.

### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

## Method Summary

Client: Posillico Dev Company at Harbor Isle LLC  
Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
A-01-R	Isotopic Thorium (Alpha Spectrometry)	DOE	TAL SL
A-01-R	Isotopic Uranium (Alpha Spectrometry)	DOE	TAL SL
GA-01-R	Radium-226 & Other Gamma Emitters (GS)	DOE	TAL SL
GA-01-R	Cesium-137 & Other Gamma Emitters (GS)	DOE	TAL SL

### Protocol References:

DOE = U.S. Department of Energy

EPA = US Environmental Protection Agency

### Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

## Sample Summary

Client: Posillico Dev Company at Harbor Isle LLC  
Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-5703-1	CC-C-048-2-4	Solid	02/21/14 09:03	02/26/14 09:20
160-5703-2	CC-C-050-0-2	Solid	02/21/14 10:00	02/26/14 09:20
160-5703-3	LT-G-026-4-6	Solid	02/21/14 10:00	02/26/14 09:20
160-5703-4	LT-G-027-8-10	Solid	02/21/14 11:40	02/26/14 09:20
160-5703-5	FB028	Water	02/21/14 14:20	02/26/14 09:20

# Client Sample Results

Client: Posillico Dev Company at Harbor Isle LLC  
 Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

**Client Sample ID: CC-C-048-2-4**

**Lab Sample ID: 160-5703-1**

Date Collected: 02/21/14 09:03

Matrix: Solid

Date Received: 02/26/14 09:20

## Method: A-01-R - Isotopic Thorium (Alpha Spectrometry)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Thorium-228	0.383		0.132	0.136	1.00	0.0637	pCi/g	03/03/14 10:32	03/06/14 16:45	1
Thorium-230	0.359		0.128	0.132	1.00	0.0679	pCi/g	03/03/14 10:32	03/06/14 16:45	1
Thorium-232	0.317		0.119	0.122	1.00	0.0575	pCi/g	03/03/14 10:32	03/06/14 16:45	1
<b>Tracer</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Thorium-229	85.4		30 - 110					03/03/14 10:32	03/06/14 16:45	1

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Uranium-233/234	0.398		0.133	0.137	1.00	0.0733	pCi/g	03/07/14 13:26	03/12/14 18:01	1
Uranium-235/236	0.0193	U	0.0389	0.0390	1.00	0.0763	pCi/g	03/07/14 13:26	03/12/14 18:01	1
Uranium-238	0.371		0.130	0.133	1.00	0.0795	pCi/g	03/07/14 13:26	03/12/14 18:01	1
<b>Tracer</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Uranium-232	81.1		30 - 110					03/07/14 13:26	03/12/14 18:01	1

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.459		0.0197	0.0508	0.100	0.0181	pCi/g	02/28/14 09:56	03/05/14 09:15	1
Bismuth-212	0.546		0.0865	0.103	0.100	0.0749	pCi/g	02/28/14 09:56	03/05/14 09:15	1
Bismuth-214	0.326		0.0146	0.0369	0.100	0.0110	pCi/g	02/28/14 09:56	03/05/14 09:15	1
Lead-210	0.407		0.0926	0.104	0.100	0.128	pCi/g	02/28/14 09:56	03/05/14 09:15	1
Lead-212	0.498		0.0119	0.0656	0.100	0.00955	pCi/g	02/28/14 09:56	03/05/14 09:15	1
Lead-214	0.375		0.0142	0.0415	0.100	0.0130	pCi/g	02/28/14 09:56	03/05/14 09:15	1
Potassium-40	6.09		0.170	0.646	2.50	0.0735	pCi/g	02/28/14 09:56	03/05/14 09:15	1
Protactinium-231	-0.202	U	0.113	0.115	1.00	0.183	pCi/g	02/28/14 09:56	03/05/14 09:15	1
Radium-226	0.805		0.127	0.190	1.00	0.143	pCi/g	02/28/14 09:56	03/05/14 09:15	1
Radium-228	0.459		0.0197	0.0508	1.00	0.0181	pCi/g	02/28/14 09:56	03/05/14 09:15	1
Thorium-234	0.475		0.110	0.121	1.00	0.144	pCi/g	02/28/14 09:56	03/05/14 09:15	1
Thallium-208	0.151		0.00905	0.0181	0.100	0.00705	pCi/g	02/28/14 09:56	03/05/14 09:15	1
Uranium-235	0.0306	U	0.0239	0.0241	1.00	0.0347	pCi/g	02/28/14 09:56	03/05/14 09:15	1
Uranium-238	0.475		0.110	0.121	1.00	0.144	pCi/g	02/28/14 09:56	03/05/14 09:15	1
Protactinium-234m	0.240	U	0.471	0.472	10.0	0.696	pCi/g	02/28/14 09:56	03/05/14 09:15	1

**Client Sample ID: CC-C-050-0-2**

**Lab Sample ID: 160-5703-2**

Matrix: Solid

Date Collected: 02/21/14 10:00

Date Received: 02/26/14 09:20

## Method: A-01-R - Isotopic Thorium (Alpha Spectrometry)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Thorium-228	0.269		0.122	0.124	1.00	0.106	pCi/g	03/03/14 10:32	03/06/14 16:45	1
Thorium-230	0.408		0.141	0.145	1.00	0.0548	pCi/g	03/03/14 10:32	03/06/14 16:45	1

TestAmerica St. Louis

# Client Sample Results

Client: Posillico Dev Company at Harbor Isle LLC  
 Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

**Client Sample ID: CC-C-050-0-2**

**Lab Sample ID: 160-5703-2**

Date Collected: 02/21/14 10:00

Matrix: Solid

Date Received: 02/26/14 09:20

## Method: A-01-R - Isotopic Thorium (Alpha Spectrometry) (Continued)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Thorium-232	0.297		0.120	0.122	1.00	0.0546	pCi/g	03/03/14 10:32	03/06/14 16:45	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Thorium-229	77.0		30 - 110					03/03/14 10:32	03/06/14 16:45	1

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Uranium-233/234	0.612		0.162	0.170	1.00	0.0773	pCi/g	03/07/14 13:29	03/12/14 18:01	1
Uranium-235/236	0.0342	U	0.0456	0.0457	1.00	0.0676	pCi/g	03/07/14 13:29	03/12/14 18:01	1
Uranium-238	0.558		0.154	0.161	1.00	0.0594	pCi/g	03/07/14 13:29	03/12/14 18:01	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Uranium-232	87.1		30 - 110					03/07/14 13:29	03/12/14 18:01	1

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Actinium 228	0.705		0.0303	0.0780	0.100	0.0273	pCi/g	02/28/14 09:56	03/06/14 02:59	1
Bismuth-212	0.809		0.0942	0.126	0.100	0.0865	pCi/g	02/28/14 09:56	03/06/14 02:59	1
Bismuth-214	0.546		0.0225	0.0610	0.100	0.0165	pCi/g	02/28/14 09:56	03/06/14 02:59	1
Lead-210	0.564		0.117	0.135	0.100	0.156	pCi/g	02/28/14 09:56	03/06/14 02:59	1
Lead-212	0.774		0.0158	0.101	0.100	0.0118	pCi/g	02/28/14 09:56	03/06/14 02:59	1
Lead-214	0.608		0.0184	0.0658	0.100	0.0154	pCi/g	02/28/14 09:56	03/06/14 02:59	1
Potassium-40	11.5		0.253	1.20	2.50	0.0821	pCi/g	02/28/14 09:56	03/06/14 02:59	1
Protactinium-231	-0.356	U	0.147	0.152	1.00	0.236	pCi/g	02/28/14 09:56	03/06/14 02:59	1
Radium-226	1.39		0.143	0.282	1.00	0.154	pCi/g	02/28/14 09:56	03/06/14 02:59	1
Radium-228	0.705		0.0303	0.0780	1.00	0.0273	pCi/g	02/28/14 09:56	03/06/14 02:59	1
Thorium-234	0.634		0.134	0.149	1.00	0.172	pCi/g	02/28/14 09:56	03/06/14 02:59	1
Thallium-208	0.246		0.0114	0.0279	0.100	0.00834	pCi/g	02/28/14 09:56	03/06/14 02:59	1
Uranium-235	0.0331	U	0.0284	0.0286	1.00	0.0358	pCi/g	02/28/14 09:56	03/06/14 02:59	1
Uranium-238	0.634		0.134	0.149	1.00	0.172	pCi/g	02/28/14 09:56	03/06/14 02:59	1
Protactinium-234m	0.814	U	0.756	0.760	10.0	1.23	pCi/g	02/28/14 09:56	03/06/14 02:59	1

**Client Sample ID: LT-G-026-4-6**

**Lab Sample ID: 160-5703-3**

Date Collected: 02/21/14 10:00

Matrix: Solid

Date Received: 02/26/14 09:20

## Method: A-01-R - Isotopic Thorium (Alpha Spectrometry)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Thorium-228	0.481		0.156	0.161	1.00	0.0858	pCi/g	03/03/14 10:32	03/06/14 16:45	1
Thorium-230	0.408		0.142	0.146	1.00	0.0630	pCi/g	03/03/14 10:32	03/06/14 16:45	1
Thorium-232	0.348		0.130	0.133	1.00	0.0549	pCi/g	03/03/14 10:32	03/06/14 16:45	1

TestAmerica St. Louis

# Client Sample Results

Client: Posillico Dev Company at Harbor Isle LLC  
 Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

## Client Sample ID: LT-G-026-4-6

Lab Sample ID: 160-5703-3

Matrix: Solid

Date Collected: 02/21/14 10:00

Date Received: 02/26/14 09:20

Tracer	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Thorium-229	75.3		30 - 110	03/03/14 10:32	03/06/14 16:45	1

### Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Uranium-233/234	0.193		0.102	0.103	1.00	0.0773	pCi/g	03/07/14 13:29	03/12/14 18:01	1
Uranium-235/236	0.0384	U	0.0555	0.0556	1.00	0.0896	pCi/g	03/07/14 13:29	03/12/14 18:01	1
Uranium-238	0.258		0.116	0.118	1.00	0.0719	pCi/g	03/07/14 13:29	03/12/14 18:01	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Uranium-232	72.8		30 - 110					03/07/14 13:29	03/12/14 18:01	1

### Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.483		0.0287	0.0571	0.100	0.0193	pCi/g	02/28/14 09:56	03/07/14 08:38	1
Bismuth-212	0.521		0.0723	0.0903	0.100	0.0675	pCi/g	02/28/14 09:56	03/07/14 08:38	1
Bismuth-214	0.382		0.0164	0.0429	0.100	0.0126	pCi/g	02/28/14 09:56	03/07/14 08:38	1
Lead-210	0.427		0.111	0.122	0.100	0.141	pCi/g	02/28/14 09:56	03/07/14 08:38	1
Lead-212	0.500		0.0121	0.0658	0.100	0.0103	pCi/g	02/28/14 09:56	03/07/14 08:38	1
Lead-214	0.415		0.0147	0.0456	0.100	0.0136	pCi/g	02/28/14 09:56	03/07/14 08:38	1
Potassium-40	6.74		0.175	0.712	2.50	0.0784	pCi/g	02/28/14 09:56	03/07/14 08:38	1
Protactinium-231	-0.124	U	0.115	0.116	1.00	0.189	pCi/g	02/28/14 09:56	03/07/14 08:38	1
Radium-226	0.821		0.112	0.182	1.00	0.132	pCi/g	02/28/14 09:56	03/07/14 08:38	1
Radium-228	0.483		0.0287	0.0571	1.00	0.0193	pCi/g	02/28/14 09:56	03/07/14 08:38	1
Thorium-234	0.453		0.113	0.123	1.00	0.147	pCi/g	02/28/14 09:56	03/07/14 08:38	1
Thallium-208	0.151		0.00844	0.0178	0.100	0.00672	pCi/g	02/28/14 09:56	03/07/14 08:38	1
Uranium-235	0.0327		0.0173	0.0176	1.00	0.0292	pCi/g	02/28/14 09:56	03/07/14 08:38	1
Uranium-238	0.453		0.113	0.123	1.00	0.147	pCi/g	02/28/14 09:56	03/07/14 08:38	1
Protactinium-234m	0.611	U	0.520	0.524	10.0	0.846	pCi/g	02/28/14 09:56	03/07/14 08:38	1

## Client Sample ID: LT-G-027-8-10

Lab Sample ID: 160-5703-4

Matrix: Solid

Date Collected: 02/21/14 11:40

Date Received: 02/26/14 09:20

Method: A-01-R - Isotopic Thorium (Alpha Spectrometry)			Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Analyte	Result	Qualifier	Uncert.	Uncert.						
Thorium-228	0.335		0.130	0.133	1.00	0.0872	pCi/g	03/03/14 10:32	03/06/14 16:45	1
Thorium-230	0.257		0.111	0.113	1.00	0.0536	pCi/g	03/03/14 10:32	03/06/14 16:45	1
Thorium-232	0.481		0.150	0.155	1.00	0.0352	pCi/g	03/03/14 10:32	03/06/14 16:45	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Thorium-229	79.0		30 - 110					03/03/14 10:32	03/06/14 16:45	1

TestAmerica St. Louis

# Client Sample Results

Client: Posillico Dev Company at Harbor Isle LLC  
 Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

**Client Sample ID: LT-G-027-8-10**

**Lab Sample ID: 160-5703-4**

**Matrix: Solid**

Date Collected: 02/21/14 11:40

Date Received: 02/26/14 09:20

**Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)**

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Uranium-233/234	0.644		0.171	0.179	1.00	0.0861	pCi/g	03/07/14 13:29	03/12/14 18:01	1
Uranium-235/236	0.0220	U	0.0390	0.0390	1.00	0.0704	pCi/g	03/07/14 13:29	03/12/14 18:01	1
Uranium-238	0.635		0.167	0.175	1.00	0.0618	pCi/g	03/07/14 13:29	03/12/14 18:01	1
<b>Tracer</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Uranium-232	80.0		30 - 110					03/07/14 13:29	03/12/14 18:01	1

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Actinium 228	0.623		0.0273	0.0692	0.100	0.0248	pCi/g	02/28/14 09:56	03/10/14 03:16	1
Bismuth-212	0.795		0.115	0.141	0.100	0.0967	pCi/g	02/28/14 09:56	03/10/14 03:16	1
Bismuth-214	0.601		0.0234	0.0667	0.100	0.0168	pCi/g	02/28/14 09:56	03/10/14 03:16	1
Lead-210	0.559		0.158	0.171	0.100	0.197	pCi/g	02/28/14 09:56	03/10/14 03:16	1
Lead-212	0.625		0.0161	0.0825	0.100	0.0163	pCi/g	02/28/14 09:56	03/10/14 03:16	1
Lead-214	0.661		0.0224	0.0722	0.100	0.0180	pCi/g	02/28/14 09:56	03/10/14 03:16	1
Potassium-40	10.4		0.239	1.09	2.50	0.0942	pCi/g	02/28/14 09:56	03/10/14 03:16	1
Protactinium-231	-0.173	U	0.154	0.155	1.00	0.252	pCi/g	02/28/14 09:56	03/10/14 03:16	1
Radium-226	1.79		0.198	0.370	1.00	0.198	pCi/g	02/28/14 09:56	03/10/14 03:16	1
Radium-228	0.623		0.0273	0.0692	1.00	0.0248	pCi/g	02/28/14 09:56	03/10/14 03:16	1
Thorium-234	0.816		0.163	0.184	1.00	0.200	pCi/g	02/28/14 09:56	03/10/14 03:16	1
Thallium-208	0.212		0.0115	0.0249	0.100	0.00887	pCi/g	02/28/14 09:56	03/10/14 03:16	1
Uranium-235	0.0611		0.0263	0.0270	1.00	0.0369	pCi/g	02/28/14 09:56	03/10/14 03:16	1
Uranium-238	0.816		0.163	0.184	1.00	0.200	pCi/g	02/28/14 09:56	03/10/14 03:16	1
Protactinium-234m	1.47		0.958	0.969	10.0	0.977	pCi/g	02/28/14 09:56	03/10/14 03:16	1

**Client Sample ID: FB028**

**Lab Sample ID: 160-5703-5**

**Matrix: Water**

Date Collected: 02/21/14 14:20

Date Received: 02/26/14 09:20

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Radium-226	0.117	U	0.148	0.148	1.00	0.246	pCi/L	02/27/14 12:46	02/28/14 14:25	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	90.9		40 - 110					02/27/14 12:46	02/28/14 14:25	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Radium-228	0.190	U	0.259	0.260	1.00	0.432	pCi/L	02/27/14 12:41	03/03/14 11:55	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	93.8		40 - 110					02/27/14 12:41	03/03/14 11:55	1
Y Carrier	85.9		40 - 110					02/27/14 12:41	03/03/14 11:55	1

TestAmerica St. Louis

# Client Sample Results

Client: Posillico Dev Company at Harbor Isle LLC  
 Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

**Client Sample ID: FB028**

**Lab Sample ID: 160-5703-5**

Date Collected: 02/21/14 14:20

Matrix: Water

Date Received: 02/26/14 09:20

## Method: A-01-R - Isotopic Thorium (Alpha Spectrometry)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Thorium-228	0.0570	U	0.121	0.121	1.00	0.228	pCi/L	03/03/14 10:13	03/05/14 15:28	1
<b>Thorium-230</b>	<b>0.237</b>		0.157	0.158	1.00	0.151	pCi/L	03/03/14 10:13	03/05/14 15:28	1
Thorium-232	-0.00873	U	0.0123	0.0124	1.00	0.121	pCi/L	03/03/14 10:13	03/05/14 15:28	1
<b>Tracer</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Thorium-229	75.2		30 - 110					03/03/14 10:13	03/05/14 15:28	1

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Uranium-233/234	-0.00260	U	0.0458	0.0458	1.00	0.142	pCi/L	03/03/14 10:13	03/05/14 15:25	1
Uranium-235/236	0.000	U	0.00972	0.00972	1.00	0.0777	pCi/L	03/03/14 10:13	03/05/14 15:25	1
Uranium-238	0.0143	U	0.0623	0.0623	1.00	0.148	pCi/L	03/03/14 10:13	03/05/14 15:25	1
<b>Tracer</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Uranium-232	88.8		30 - 110					03/03/14 10:13	03/05/14 15:25	1

## Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
<b>Actinium-228</b>	<b>22.1</b>		9.20	9.45	50.0	9.62	pCi/L	02/27/14 14:19	03/07/14 08:16	1
Cesium-137	0.00167	U	2.05	2.05	20.0	3.61	pCi/L	02/27/14 14:19	03/07/14 08:16	1
Bismuth-212	8.75	U	25.8	25.8	50.0	44.1	pCi/L	02/27/14 14:19	03/07/14 08:16	1
Bismuth-214	7.01	U	7.29	7.33	50.0	11.4	pCi/L	02/27/14 14:19	03/07/14 08:16	1
Lead-212	7.57	U	7.64	7.73	50.0	9.35	pCi/L	02/27/14 14:19	03/07/14 08:16	1
Lead-214	8.23	U	7.99	8.04	50.0	10.3	pCi/L	02/27/14 14:19	03/07/14 08:16	1
Potassium-40	17.4	U	37.8	37.8	75.0	69.7	pCi/L	02/27/14 14:19	03/07/14 08:16	1
<b>Protactinium-234m</b>	<b>664 G</b>		394	399	75.0	391	pCi/L	02/27/14 14:19	03/07/14 08:16	1
Protactinium-231	24.2	U G	46.4	46.5	75.0	99.7	pCi/L	02/27/14 14:19	03/07/14 08:16	1

TestAmerica St. Louis

# QC Sample Results

Client: Posillico Dev Company at Harbor Isle LLC  
 Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

## Method: 903.0 - Radium-226 (GFPC)

**Lab Sample ID:** MB 160-107868/1-A

**Matrix:** Water

**Analysis Batch:** 108004

**Client Sample ID:** Method Blank

**Prep Type:** Total/NA

**Prep Batch:** 107868

Analyte	MB MB		Count (2σ+/-)	Total (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Radium-226	0.1267	U	0.119	0.119	1.00	0.180	pCi/L	02/27/14 12:46	02/28/14 14:24	1
<b>Carrier</b>										
Ba Carrier	83.2			40 - 110				02/27/14 12:46	02/28/14 14:24	1

**Lab Sample ID:** LCS 160-107868/2-A

**Matrix:** Water

**Analysis Batch:** 108004

**Client Sample ID:** Lab Control Sample

**Prep Type:** Total/NA

**Prep Batch:** 107868

Analyte	Spike MB		LCS Result	LCS Qual	Total		RL	MDC	Unit	%Rec.	Limits
	Added	Result			Uncert. (2σ+/-)	%Rec.					
Radium-226	11.2	10.52	1.21	1.00	0.177	94	68 - 137	pCi/L			
<b>Carrier</b>											
Ba Carrier	90.0		40 - 110								

**Lab Sample ID:** 160-5703-5 DU

**Matrix:** Water

**Analysis Batch:** 108004

**Client Sample ID:** FB028

**Prep Type:** Total/NA

**Prep Batch:** 107868

Analyte	Sample Sample		DU Result	DU Qual	Total		RL	MDC	Unit	RER	Limit
	Result	Qual			Uncert. (2σ+/-)	%Rec.					
Radium-226	0.117	U	0.1058	U	0.121	1.00	0.196	pCi/L		0.04	1
<b>Carrier</b>											
Ba Carrier	87.3		40 - 110								

## Method: 904.0 - Radium-228 (GFPC)

**Lab Sample ID:** MB 160-107867/1-A

**Matrix:** Water

**Analysis Batch:** 108084

**Client Sample ID:** Method Blank

**Prep Type:** Total/NA

**Prep Batch:** 107867

Analyte	MB MB		Count (2σ+/-)	Total (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Radium-228	0.02661	U	0.161	0.161	1.00	0.286	pCi/L	02/27/14 12:41	03/03/14 11:54	1
<b>Carrier</b>										
Ba Carrier	104		40 - 110					02/27/14 12:41	03/03/14 11:54	1
Y Carrier	86.3		40 - 110					02/27/14 12:41	03/03/14 11:54	1

TestAmerica St. Louis

# QC Sample Results

Client: Posillico Dev Company at Harbor Isle LLC  
 Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

## Method: 904.0 - Radium-228 (GFPC) (Continued)

**Lab Sample ID: LCS 160-107867/2-A**

**Matrix: Water**

**Analysis Batch: 108084**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Prep Batch: 107867**

Analyte	Spike Added	LCS		Uncert. (2σ+/-)	Total		%Rec.	Limits
		Result	Qual		RL	MDC		
Radium-228	3.95	3.226		0.466	1.00	0.265	pCi/L	82 56 - 140
<b>Carrier</b>								
Ba Carrier	110			40 - 110				
Y Carrier	86.3			40 - 110				

## Method: A-01-R - Isotopic Thorium (Alpha Spectrometry)

**Lab Sample ID: MB 160-108019/1-A**

**Matrix: Water**

**Analysis Batch: 108595**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 108019**

Analyte	MB Result	MB Qualifier	Count		Total		Prepared	Analyzed	Dil Fac	
			Uncert. (2σ+/-)	Uncert. (2σ+/-)	RL	MDC				
Thorium-228	-0.04209	U	0.235	0.235	1.00	0.574	pCi/L	03/03/14 10:13	03/05/14 15:28	
Thorium-230	0.006558	U	0.117	0.117	1.00	0.341	pCi/L	03/03/14 10:13	03/05/14 15:28	
Thorium-232	0.1606	U	0.214	0.215	1.00	0.339	pCi/L	03/03/14 10:13	03/05/14 15:28	
<b>Tracer</b>			<b>MB %Yield</b>	<b>MB Qualifier</b>	<b>Limits</b>			<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Thorium-229	35.8				30 - 110			03/03/14 10:13	03/05/14 15:28	1

**Lab Sample ID: LCS 160-108019/2-A**

**Matrix: Water**

**Analysis Batch: 108596**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Prep Batch: 108019**

Analyte	Spike Added	LCS		Uncert. (2σ+/-)	Total		%Rec.	Limits
		Result	Qual		RL	MDC		
Thorium-230	8.64	9.725		1.25	1.00	0.154	pCi/L	113 81 - 125
<b>Tracer</b>								
Thorium-229	81.9			30 - 110				

**Lab Sample ID: LCSD 160-108019/3-A**

**Matrix: Water**

**Analysis Batch: 108599**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total/NA**

**Prep Batch: 108019**

Analyte	Spike Added	LCSD		Uncert. (2σ+/-)	Total		%Rec.	Limits	RER	Limit
		Result	Qual		RL	MDC				
Thorium-230	8.64	9.623		1.25	1.00	0.124	pCi/L	111 81 - 125	0.04	1
<b>Tracer</b>										
Thorium-229	78.8			30 - 110						

TestAmerica St. Louis

# QC Sample Results

Client: Posillico Dev Company at Harbor Isle LLC  
 Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

## Method: A-01-R - Isotopic Thorium (Alpha Spectrometry) (Continued)

**Lab Sample ID:** MB 160-108024/1-A

**Matrix:** Solid

**Analysis Batch:** 109030

**Client Sample ID:** Method Blank

**Prep Type:** Total/NA

**Prep Batch:** 108024

Analyte	Result	MB	MB	Count		Total		Prepared	Analyzed	Dil Fac
				Uncert.	(2σ+/-)	Uncert.	(2σ+/-)			
Thorium-228	0.03541	U		0.0508	0.0508	1.00	0.0860	pCi/g	03/03/14 10:32	03/06/14 16:45
Thorium-230	0.009356	U		0.0215	0.0215	1.00	0.0455	pCi/g	03/03/14 10:32	03/06/14 16:45
Thorium-232	0.00000	U		0.00373	0.00373	1.00	0.0298	pCi/g	03/03/14 10:32	03/06/14 16:45
Tracer	%Yield	MB	MB	Spike	LCS	LCS	Total			
Thorium-229	91.8			Added	Result	Qual	Uncert.	Prepared	Analyzed	Dil Fac
				30 - 110			(2σ+/-)	03/03/14 10:32	03/06/14 16:45	1

**Lab Sample ID:** LCS 160-108024/2-A

**Matrix:** Solid

**Analysis Batch:** 109031

**Client Sample ID:** Lab Control Sample

**Prep Type:** Total/NA

**Prep Batch:** 108024

Analyte	Result	MB	MB	Spike		LCS		Total		%Rec.	Limits
				Added	Result	Qual	Uncert.	(2σ+/-)	RL		
Thorium-230	24.5				24.54		2.53		1.00	0.114	pCi/g
Thorium-229	82.8									100	81 - 118

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

**Lab Sample ID:** MB 160-108021/1-A

**Matrix:** Water

**Analysis Batch:** 108605

**Client Sample ID:** Method Blank

**Prep Type:** Total/NA

**Prep Batch:** 108021

Analyte	Result	MB	MB	Count		Total		Prepared	Analyzed	Dil Fac
				Uncert.	(2σ+/-)	Uncert.	(2σ+/-)			
Uranium-233/234	0.07756	U		0.102	0.102	1.00	0.164	pCi/L	03/03/14 10:13	03/05/14 15:25
Uranium-235/236	-0.005170	U		0.0103	0.0103	1.00	0.126	pCi/L	03/03/14 10:13	03/05/14 15:25
Uranium-238	0.009675	U		0.0465	0.0465	1.00	0.126	pCi/L	03/03/14 10:13	03/05/14 15:25
Tracer	%Yield	MB	MB	Spike	LCS	LCS	Total			
Uranium-232	83.1			Added	Result	Qual	Uncert.	Prepared	Analyzed	Dil Fac
				30 - 110			(2σ+/-)	03/03/14 10:13	03/05/14 15:25	1

**Lab Sample ID:** LCS 160-108021/2-A

**Matrix:** Water

**Analysis Batch:** 108607

**Client Sample ID:** Lab Control Sample

**Prep Type:** Total/NA

**Prep Batch:** 108021

Analyte	Result	MB	MB	Spike		LCS		Total		%Rec.	Limits
				Added	Result	Qual	Uncert.	(2σ+/-)	RL		
Uranium-233/234	12.7				12.79		1.50		1.00	0.138	pCi/L
Uranium-238	13.0				13.69		1.58		1.00	0.111	pCi/L
Uranium-232	86.9									105	83 - 121

TestAmerica St. Louis

# QC Sample Results

Client: Posillico Dev Company at Harbor Isle LLC  
 Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry) (Continued)

Lab Sample ID: LCSD 160-108021/3-A								Client Sample ID: Lab Control Sample Dup						
Matrix: Water								Prep Type: Total/NA						
Analysis Batch: 108608								Prep Batch: 108021						
Analyte		Spike	LCSD	LCSD	Total	Uncert.	(2σ+/-)	RL	MDC	Unit	%Rec.	Limits	RER	RER Limit
Uranium-233/23		Added	Result	Qual		(2σ+/-)			pCi/L		90	84 - 120	0.47	1
4		12.7	11.43			1.36		1.00	0.175					
Uranium-238			13.0	11.72		1.39		1.00	0.106	pCi/L	90	83 - 121	0.67	1
<i>Tracer</i>		LCSD	LCSD											
		%Yield	Qualifier		Limits									
Uranium-232		92.1			30 - 110									

Lab Sample ID: MB 160-109197/1-A								Client Sample ID: Method Blank						
Matrix: Solid								Prep Type: Total/NA						
Analysis Batch: 110045								Prep Batch: 109197						
Analyte		MB	MB	Count	Total	Uncert.	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
Uranium-233/234		Result	U			0.0352	0.0353	1.00	0.0522	pCi/g	03/07/14 13:26	03/12/14 18:01		1
Uranium-235/236		-0.002343	U			0.00469	0.00469	1.00	0.0569	pCi/g	03/07/14 13:26	03/12/14 18:01		1
Uranium-238		0.01816	U			0.0286	0.0286	1.00	0.0456	pCi/g	03/07/14 13:26	03/12/14 18:01		1
<i>Tracer</i>		MB	MB											
		%Yield	Qualifier		Limits									
Uranium-232		93.7			30 - 110						Prepared	Analyzed	Dil Fac	
											03/07/14 13:26	03/12/14 18:01		1

Lab Sample ID: LCS 160-109197/2-A								Client Sample ID: Lab Control Sample						
Matrix: Solid								Prep Type: Total/NA						
Analysis Batch: 110046								Prep Batch: 109197						
Analyte		Spike	LCS	LCs	Total	Uncert.	(2σ+/-)	RL	MDC	Unit	%Rec.	Limits		
Uranium-233/23		Added	Result	Qual		0.745	0.745	1.00	0.0474	pCi/g	100	84 - 120		
4		6.37	6.397											
Uranium-238			6.51	6.500		0.754		1.00	0.0312	pCi/g	100	82 - 122		
<i>Tracer</i>		LCS	LCS											
		%Yield	Qualifier		Limits									
Uranium-232		90.3			30 - 110									

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)														
Lab Sample ID: MB 160-107877/1-A								Client Sample ID: Method Blank						
Matrix: Water								Prep Type: Total/NA						
Analysis Batch: 107940								Prep Batch: 107877						
Analyte		MB	MB	Count	Total	Uncert.	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
Actinium-228		Result	U			6.90	6.96	50.0	11.2	pCi/L	02/27/14 14:19	02/28/14 03:23		1
Cesium-137		1.815	U			2.12	2.12	20.0	3.47	pCi/L	02/27/14 14:19	02/28/14 03:23		1
Bismuth-212		0.0000	U			12.0	12.0	50.0	43.0	pCi/L	02/27/14 14:19	02/28/14 03:23		1
Bismuth-214		2.846	U			7.67	7.67	50.0	10.3	pCi/L	02/27/14 14:19	02/28/14 03:23		1
Lead-212		-1.979	U			4.74	4.75	50.0	7.23	pCi/L	02/27/14 14:19	02/28/14 03:23		1

TestAmerica St. Louis

# QC Sample Results

Client: Posillico Dev Company at Harbor Isle LLC  
 Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

## Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS) (Continued)

**Lab Sample ID: MB 160-107877/1-A**

**Matrix: Water**

**Analysis Batch: 107940**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 107877**

Analyte	Result	MB MB MB	Qualifier	Count	Total	MDC	Unit	Prepared	Analyzed	Dil Fac
				Uncert. (2σ+/-)	Uncert. (2σ+/-)					
Lead-214	-1.771	U		7.48	7.48	50.0	pCi/L	02/27/14 14:19	02/28/14 03:23	1
Potassium-40	-51.20	U		85.8	86.0	75.0	pCi/L	02/27/14 14:19	02/28/14 03:23	1
Protactinium-234m	45.00	U G		266	266	75.0	pCi/L	02/27/14 14:19	02/28/14 03:23	1
Protactinium-231	8.099	U G		32.7	32.7	75.0	pCi/L	02/27/14 14:19	02/28/14 03:23	1

**Lab Sample ID: LCS 160-107877/2-A**

**Matrix: Water**

**Analysis Batch: 108323**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Prep Batch: 107877**

Analyte	Spike Added	LCS		Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	Limits	%Rec.
		Result	Qual							
Americium-241	137000	133600		15400		238	pCi/L	97	90 - 111	
Cesium-137	50300	49510		4950	20.0	92.1	pCi/L	98	90 - 111	
Cobalt-60	58700	57680		5700		56.5	pCi/L	98	89 - 110	

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

**Lab Sample ID: MB 160-107955/1-A**

**Matrix: Solid**

**Analysis Batch: 108306**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 107955**

Analyte	Result	MB MB MB	Qualifier	Count	Total	MDC	Unit	Prepared	Analyzed	Dil Fac
				Uncert. (2σ+/-)	Uncert. (2σ+/-)					
Actinium 228	0.009706	U		0.00809	0.00815	0.100	pCi/g	02/28/14 09:56	03/04/14 03:09	1
Bismuth-212	0.01583	U		0.0299	0.0299	0.100	pCi/g	02/28/14 09:56	03/04/14 03:09	1
Bismuth-214	0.003687	U		0.00341	0.00343	0.100	pCi/g	02/28/14 09:56	03/04/14 03:09	1
Lead-210	0.03886	U		0.0558	0.0560	0.100	pCi/g	02/28/14 09:56	03/04/14 03:09	1
Lead-212	0.002962	U		0.00523	0.00524	0.100	pCi/g	02/28/14 09:56	03/04/14 03:09	1
Lead-214	0.005871	U		0.00491	0.00495	0.100	pCi/g	02/28/14 09:56	03/04/14 03:09	1
Potassium-40	0.0000	U		0.0416	0.0433	2.50	pCi/g	02/28/14 09:56	03/04/14 03:09	1
Protactinium-231	0.01801	U		0.0590	0.0590	1.00	pCi/g	02/28/14 09:56	03/04/14 03:09	1
Radium-226	-0.005560	U		0.0530	0.0530	1.00	pCi/g	02/28/14 09:56	03/04/14 03:09	1
Radium-228	0.009706	U		0.00809	0.00815	1.00	pCi/g	02/28/14 09:56	03/04/14 03:09	1
Thorium-234	0.03113	U		0.0495	0.0496	1.00	pCi/g	02/28/14 09:56	03/04/14 03:09	1
Thallium-208	0.003029	U		0.00296	0.00298	0.100	pCi/g	02/28/14 09:56	03/04/14 03:09	1
Uranium-235	0.01139	U		0.0113	0.0113	1.00	pCi/g	02/28/14 09:56	03/04/14 03:09	1
Uranium-238	0.03113	U		0.0495	0.0496	1.00	pCi/g	02/28/14 09:56	03/04/14 03:09	1
Protactinium-234m	-0.1300	U		0.360	0.360	10.0	pCi/g	02/28/14 09:56	03/04/14 03:09	1

**Lab Sample ID: LCS 160-107955/2-A**

**Matrix: Solid**

**Analysis Batch: 108306**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Prep Batch: 107955**

Analyte	Spike Added	LCS		Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	Limits	%Rec.
		Result	Qual							
Americium-241	101	102.2		10.6		0.186	pCi/g	101	87 - 116	
Cesium-137	35.7	35.59		3.71	0.100	0.0700	pCi/g	100	87 - 120	
Cobalt-60	41.7	41.32		4.15		0.0413	pCi/g	99	87 - 115	

TestAmerica St. Louis

# QC Association Summary

Client: Posillico Dev Company at Harbor Isle LLC  
 Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

## Rad

### Leach Batch: 107601

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-5703-1	CC-C-048-2-4	Total/NA	Solid	Dry and Grind	
160-5703-2	CC-C-050-0-2	Total/NA	Solid	Dry and Grind	
160-5703-3	LT-G-026-4-6	Total/NA	Solid	Dry and Grind	
160-5703-4	LT-G-027-8-10	Total/NA	Solid	Dry and Grind	

### Prep Batch: 107867

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-5703-5	FB028	Total/NA	Water	PrecSep_0	
LCS 160-107867/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
MB 160-107867/1-A	Method Blank	Total/NA	Water	PrecSep_0	

### Prep Batch: 107868

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-5703-5	FB028	Total/NA	Water	PrecSep_0	
160-5703-5 DU	FB028	Total/NA	Water	PrecSep_0	
LCS 160-107868/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
MB 160-107868/1-A	Method Blank	Total/NA	Water	PrecSep_0	

### Prep Batch: 107877

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-5703-5	FB028	Total/NA	Water	Fill_Geo-0	
LCS 160-107877/2-A	Lab Control Sample	Total/NA	Water	Fill_Geo-0	
MB 160-107877/1-A	Method Blank	Total/NA	Water	Fill_Geo-0	

### Prep Batch: 107955

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-5703-1	CC-C-048-2-4	Total/NA	Solid	Fill_Geo-0	107601
160-5703-2	CC-C-050-0-2	Total/NA	Solid	Fill_Geo-0	107601
160-5703-3	LT-G-026-4-6	Total/NA	Solid	Fill_Geo-0	107601
160-5703-4	LT-G-027-8-10	Total/NA	Solid	Fill_Geo-0	107601
LCS 160-107955/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-0	
MB 160-107955/1-A	Method Blank	Total/NA	Solid	Fill_Geo-0	

### Prep Batch: 108019

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-5703-5	FB028	Total/NA	Water	ExtChrom	
LCS 160-108019/2-A	Lab Control Sample	Total/NA	Water	ExtChrom	
LCSD 160-108019/3-A	Lab Control Sample Dup	Total/NA	Water	ExtChrom	
MB 160-108019/1-A	Method Blank	Total/NA	Water	ExtChrom	

### Prep Batch: 108021

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-5703-5	FB028	Total/NA	Water	ExtChrom	
LCS 160-108021/2-A	Lab Control Sample	Total/NA	Water	ExtChrom	
LCSD 160-108021/3-A	Lab Control Sample Dup	Total/NA	Water	ExtChrom	
MB 160-108021/1-A	Method Blank	Total/NA	Water	ExtChrom	

### Prep Batch: 108024

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-5703-1	CC-C-048-2-4	Total/NA	Solid	ExtChrom	107601
160-5703-2	CC-C-050-0-2	Total/NA	Solid	ExtChrom	107601

TestAmerica St. Louis

# QC Association Summary

Client: Posillico Dev Company at Harbor Isle LLC  
Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

## Rad (Continued)

### Prep Batch: 108024 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-5703-3	LT-G-026-4-6	Total/NA	Solid	ExtChrom	107601
160-5703-4	LT-G-027-8-10	Total/NA	Solid	ExtChrom	107601
LCS 160-108024/2-A	Lab Control Sample	Total/NA	Solid	ExtChrom	
MB 160-108024/1-A	Method Blank	Total/NA	Solid	ExtChrom	

### Prep Batch: 109197

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-5703-1	CC-C-048-2-4	Total/NA	Solid	ExtChrom	107601
160-5703-2	CC-C-050-0-2	Total/NA	Solid	ExtChrom	107601
160-5703-3	LT-G-026-4-6	Total/NA	Solid	ExtChrom	107601
160-5703-4	LT-G-027-8-10	Total/NA	Solid	ExtChrom	107601
LCS 160-109197/2-A	Lab Control Sample	Total/NA	Solid	ExtChrom	
MB 160-109197/1-A	Method Blank	Total/NA	Solid	ExtChrom	

1

2

3

4

5

6

7

8

9

10

11

12

## Tracer/Carrier Summary

Client: Posillico Dev Company at Harbor Isle LLC  
Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

### Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

#### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)
160-5703-5	FB028	90.9
160-5703-5 DU	FB028	87.3
LCS 160-107868/2-A	Lab Control Sample	90.0
MB 160-107868/1-A	Method Blank	83.2

#### Tracer/Carrier Legend

Ba = Ba Carrier

### Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

#### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
160-5703-5	FB028	93.8	85.9
LCS 160-107867/2-A	Lab Control Sample	110	86.3
MB 160-107867/1-A	Method Blank	104	86.3

#### Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

### Method: A-01-R - Isotopic Thorium (Alpha Spectrometry)

Matrix: Solid

Prep Type: Total/NA

#### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Th-229 (30-110)
160-5703-1	CC-C-048-2-4	85.4
160-5703-2	CC-C-050-0-2	77.0
160-5703-3	LT-G-026-4-6	75.3
160-5703-4	LT-G-027-8-10	79.0
LCS 160-108024/2-A	Lab Control Sample	82.8
MB 160-108024/1-A	Method Blank	91.8

#### Tracer/Carrier Legend

Th-229 = Thorium-229

### Method: A-01-R - Isotopic Thorium (Alpha Spectrometry)

Matrix: Water

Prep Type: Total/NA

#### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Th-229 (30-110)
160-5703-5	FB028	75.2
LCS 160-108019/2-A	Lab Control Sample	81.9
LCSD 160-108019/3-A	Lab Control Sample Dup	78.8
MB 160-108019/1-A	Method Blank	35.8

#### Tracer/Carrier Legend

Th-229 = Thorium-229

TestAmerica St. Louis

## Tracer/Carrier Summary

Client: Posillico Dev Company at Harbor Isle LLC  
Project/Site: Glen Isle, Radiological Analyses

TestAmerica Job ID: 160-5703-1

### Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Matrix: Solid

Prep Type: Total/NA

#### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	U-232 (30-110)
160-5703-1	CC-C-048-2-4	81.1
160-5703-2	CC-C-050-0-2	87.1
160-5703-3	LT-G-026-4-6	72.8
160-5703-4	LT-G-027-8-10	80.0
LCS 160-109197/2-A	Lab Control Sample	90.3
MB 160-109197/1-A	Method Blank	93.7

#### Tracer/Carrier Legend

U-232 = Uranium-232

### Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Matrix: Water

Prep Type: Total/NA

#### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	U-232 (30-110)
160-5703-5	FB028	88.8
LCS 160-108021/2-A	Lab Control Sample	86.9
LCSD 160-108021/3-A	Lab Control Sample Dup	92.1
MB 160-108021/1-A	Method Blank	83.1

#### Tracer/Carrier Legend

U-232 = Uranium-232

TestAmerica St. Louis